

Breast complaints (pain, lumps, swelling).....	8	.41
Soreness in testes.....	1	.05
Total complaints referable to the glandular system.....	22	1.12
Total presenting complaints.....	1,961	100.00

EXPLANATION OF TABLES

Table 1 gives an analysis of the second clinical category, entitled "Patient's Own Estimate of Present Status," which is set up in contradistinction to the foregoing enumeration of symptoms representing the patient's voluntary statement of complaints. The table is composed of a summary of replies to direct questioning by the physician regarding the patient's habits, as listed in column No. 1 of the table.

The total number of amebiasis case histories in which the "patient's estimate of present status" is recorded on presentation, is 434.

In this group there were nine cases of luetic infection (2.07 per cent); twenty-two other individuals had a history of having had tuberculosis (5.07 per cent).

TABLE 2.—*Patient's Own Estimate of Present Status*

MISCELLANEOUS HABITS			
<i>Use of Tea</i>		<i>Use of Coffee</i>	
None.....	68	None.....	46
Occasionally.....	57	Occasionally.....	26
Regularly.....	26	Regularly.....	89
Total.....	151	Total.....	161
<i>Use of Tobacco</i>		<i>Use of Alcohol</i>	
None.....	82	None.....	70
Occasionally.....	12	Occasionally.....	41
Regularly.....	49	Total.....	111
Total.....	143		
<i>Use of Drugs</i>			
None.....	49		
Cathartics.....	9		
Gland preparations.....	6		
For sleep or pain.....	8		
Miscellaneous.....	18		
Total.....	90		

COMMENT

It is the conviction of the author that only by the kind of simplification attempted in this paper can the problem of temperate zone and subtropical chronic amebiasis be impressed upon the general practitioner. There is a minimum of difficulty in diagnosing amebiasis in its acute and obvious form. There is far more difficulty in recognizing it where the complaints seem trivial, and the evidences of disease are obscure.

IN CONCLUSION

In conclusion, it seems to us that these analyses primarily emphasize that in chronic human amebiasis, in the temperate zone, the disease must be studied in its possible effects in tissues far removed from the large bowel. They also indicate plainly that, from symptoms alone, there is inadequate opportunity to evaluate closely the importance of amebiasis in chronic human disease. The wide range of symptoms in this group should stimulate us to prolonged and searching study of the interaction of *Entameba histolytica* with all tissues and organs.

Bank of America Building.

CARCINOMA OF THE BREAST—ITS
ROENTGEN TREATMENT*

WITH SPECIAL REFERENCE TO THE
INOPERABLE CASE

By J. M. REHFISCH, M. D.

AND

L. H. GARLAND, M. B.
San Francisco

DISCUSSION by Leo Eloesser, M. D., San Francisco;
Orville N. Meland, M. D., Los Angeles; Alson R. Kilgore,
M. D., San Francisco.

STATISTICAL and quantitative reports have been something of a fetish in medical literature for some time, but there still appear to be a few fields of investigation which fail to yield satisfactorily, in ordinary clinical practice, to the statistical method, and carcinoma of the breast is one of these. This is largely due, of course, to the marked variation in the pathological structure of breast tumors, to the widely varying biological reactions of the host, and, last but not least, to the difficulty of complete follow-up in this country.

In a broad sense each case of breast malignancy is an individual problem, with but superficial relationship to any other case. Therefore one cannot group together all types in considering the application or the results of treatment. Malignancy in a pregnant woman under thirty is a very different disease from malignancy in a woman over seventy. How can we make brief statistics out of the response to treatment of these two types of cases?

For purposes of this paper we have abandoned any attempt at statistical evaluation and wish to present merely our clinical impressions as to the results obtainable with radiation, chiefly external high voltage radiation. Our experience in the treatment of these tumors goes back thirteen years. During that time some fundamental principles of technique were evolved and have since been adhered to (in the treatment of about four hundred cases).

GENERAL PRINCIPLES

The technique is based on the following general principles—principles largely biological and not readily susceptible to scientific proof. We believe that cancer stimulates in most people a definite resistance reaction which, in some cases, is almost sufficient to control the growth of the tumor. This resistance is well seen in some types of scirrhous breast cancer, and some types of basal cell skin cancer. We feel that radiation in adequate dosage is an aid to this resistance, but that there exists a very real danger of damaging it by too rapid intensive dosage, especially when this is given postoperatively. It is known, of course, that protracted massive radiation will control inoperable tumors in certain cases (using either external radiation, interstitial radiation or both), but this massive type of radiation can only be used in

* Read before the Radiology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

relatively localized tumors. The problem, in the average case of carcinoma of the breast, is not therefore one of killing all the cancer cells, throughout the wide zone of involvement, but rather of arresting their growth and extension and, perhaps, causing their enclosure in fibrous tissue; the cells are thereby rendered inactive for a variable period.

Cancer of the breast in the majority of cases is not a local disease; the perimammary lymphatics are usually invaded and the axillary, supraclavicular and other lymph nodes often involved. Hence the problem of how wide an area one should include in the field of radiation is an ever present one.

In designing our method of attack, we are strongly influenced by Sampson-Handley's pathological work. As you are well aware, he has shown that lymphatic permeation develops early and is widespread in many cases; hence a wide field must be radiated to include the entire zone of probable permeation. To achieve homogeneous beam intensity over a field so wide, it is necessary to radiate at a long target skin distance. Our usual distance is, therefore, at least 70 centimeters, and our usual radiation field an area 35 centimeters in diameter.

EFFECTS OF RADIATION

The therapeutic result of radiation is believed to be due to both a direct and an indirect effect. There is a direct destructive effect on some of the cells of both the tumor and its stroma. Some cells in both are killed; some are merely damaged. Direct injury to the blood vessels plays the chief indirect part by interfering with the nutrition of those cells already damaged, but not killed. It is well known that cells undergoing mitosis are more susceptible to damage by radiation than resting cells; Ludford,¹ however, finds no specific radiation effect on cancer cells as such. He believes that the primary effects are the same on all cells, but that the capacity for recovery is less and the late changes more marked in tumor cells; it is obvious, however, that such cells are more vulnerable than normal cells.

Many years ago Ewing observed that examination of mammary cancers thoroughly treated with x-rays reveals a series of striking changes, although in the residual fibrous tissue some tumor cells may survive. Lee² summarizes the changes as necrosis, with nuclear hyperchromatism, hydropic degeneration of the cellular cytoplasm and granular degeneration of the connective tissue stroma surrounding the carcinoma cells. Ultimately the tumor cells may disappear and a granular detritus remain. Frequently well marked endarteritis is seen in the radiated area, and eventually fully radiated tumors are reduced to dense fibrous cicatricial tissue. One of us has observed all of these changes under the microscope.

INTERVAL BETWEEN RADIATION AND OPERATION

The above pathological changes take some time to develop, the exact duration depending on several factors, such as the rate of delivery of the

radiation, the total dose applied, the rate of growth of the tumor and the general resistance of the patient. One of the problems in breast treatment today is the decision (in those cases which have received a course of preoperative radiation) as to how soon operation should be performed. Some believe that operation should be done soon after the radiation is finished, (1) to avoid the stage of hyperemia which occurs after treatment, (2) to avoid the possibility of further growth should the tumor be utterly radioresistant, and (3) to avoid indecision on the part of the patient as regards the need for operation should the tumor recede much. Some believe that operation should be done about six weeks after the radiation is finished, since (1) during that interval such beneficial changes as will occur usually take place, and (2) the tumor may shrink considerably and render amputation in bulky tumor cases much more simple. For figures from several well-known clinics see Table 2.

Some physicians, such as Forssell, repeat the preoperative course in cases that show good recession of tumor or axillary nodes, and again wait six weeks. The preoperative course may even be repeated three or four times before operation is performed. In this connection it is of interest to note a paper by Jüngling² in which he, a surgeon, summarizes his observation in fifty-two cases in an attempt to answer the following questions: (1) Can carcinoma of the breast be radiated successfully? (2) Does preoperative radiation render the following operation more difficult? (3) How do the wounds heal in the radiated areas if radical operation is done by the knife or by endothermy? He operated from three to six weeks after a short, six day preoperative course, which consisted of one E. D. (600 r) to the involved side, front and back. He noted no cases where the tumor increased in size following radiation. He believed that in nine per cent of the cases tissue induration made the operation more difficult, but that in the rest no significant difficulty was added. The wounds healed readily (except in a few endothermy cases where the apparatus functioned poorly), and transplantations, when needed, took well, although from the surrounding radiated tissue.

In the majority of the cases in our series, chiefly for technical surgical reasons, operation followed immediately or very soon after the course of preoperative radiation was finished.

RADIATION IN OPERABLE CASES

We believe strongly in the value of preoperative radiation. This is partly on account of our own clinical experience, and partly for the following two well known reasons: (1) It has been shown (Murphy et al.) that cancer tissue grafted under the skin in a region previously given an erythema dose of radiation, fails to take in a high percentage of cases, although a fragment from the same tumor, grafted in a non-radiated area on the same animal, takes in a high number of instances. Preoperative radiation, therefore, diminishes the potential risk from implanting tumor cells in the

wound at biopsy or operation. (2) It has also been shown that preoperative radiation frequently destroys or at least reduces the vitality of outlying cancer tissue in lymphatic vessels or nodes. Forssell and Westermarck have shown that doubtfully operable lesions may thereby be made operable.

Preoperative Course.—Our preoperative course is given as follows: one suberythema dose (600 r) anteriorly to the entire hemithorax on the involved side, and one-half that dose posteriorly to the axillary-supraclavicular area; this course is usually given in four days—200 r daily anteriorly for three days, using a 35 centimeter diameter field and a 70 centimeter target skin distance, and 300 r posteriorly on the fourth day, using a 25 centimeter field and a 50 centimeter T. S. D. The other factors are 200 KVP (pulsating, mechanical rectifier), filter 0.5 millimeter Cu. plus 1.0 millimeter Al. (effective wave length 0.16 Å), 30 milliamperes.

The output, at 50 centimeters target chamber distance, is 80 r per minute in air (without backscatter, using a small field).^{*} This dose, being spread over four days, is usually not associated with any serious roentgen sickness. This is important, especially if the patient is to be operated on soon after the radiation is completed. Sodium amytal (gr. 3), given immediately after each treatment helps to allay nausea in sensitive patients.

Postoperative Course.—We believe that postoperative radiation is valuable, though less so than preoperative. Ewing states that postoperative radiation in judicious doses can destroy or render inert outlying foci and operatively implanted cells. It therefore destroys at an early stage, or diminishes the tendency for, local recurrences, and prevents or delays the spread of disease.

Since we believe that we had some very unfortunate results with massive postoperative radiation in our early work (inspired by the enthusiastic reports from the Erlangen massive technique school), we believe that this radiation should be given in moderation and slowly. Hence our postoperative course consists of six doses of 150 to 200 r delivered once weekly for six weeks, to the entire hemithorax, anteriorly (at 70 centimeters T. S. D., with a 35 centimeter diameter field).

We believe that these relatively small doses, spread over a long interval of time, are more likely to aid the biological defense mechanism than more rapidly given intense doses. If everything goes well we repeat the course in three months, again in six months and again in one year.

We have been really surprised by the number of patients who have for long periods escaped recurrence, even with extensive lesions, under this regime. It is superfluous to say that the associated surgical work has been as careful and thorough as is possible. But there were, nevertheless, many women in whom one could hardly hope for cure

^{*} Since backscatter to the skin with these factors, at 70 cm. TSD, is approximately 50 per cent, our 600 r air dose equals 900 r measured on the skin. The depth dose at 10 cm. in water with these factors is a little over 50 per cent.

TABLE 1.—*Ca. Mammæ—Five-Year Clinical Cures All Groups*

Author and Date	Treatment	
	Surgery alone	Radiation with Surgery
Lee 1928	15%	39%
Forsell 1930	21%	40%
Hintze (collected) 1931....	28%	38%
Pfahler 1932	29%	40%
Adair 1932	10%	40%
Authors (collected) 1932	29%	40%
These include Deaver, Greenough figures, etc.		

Note.—Lee and Adair separately publish five-year cures in cases treated by radiation alone (external plus interstitial radiation): 36 per cent.

by operation alone, and yet in whom clinical cures of many years standing were obtained. For statistics from world literature see Table 1.

RADIATION IN INOPERABLE CASES

What constitutes an inoperable case? The answer to this question depends on the size and extent of the primary tumor and its associated adenopathy, the presence or absence of fixation, and the age and resistance of the patient. Assuming that by "inoperable" one means "probably incurable by radical surgery," it has been estimated (and statistics seem to prove) that the majority of patients seeking medical advice for breast cancer are inoperable. Hence the inoperable case constitutes a large problem in the care of cancer of the breast.

How should it be treated? Forsell's statistics show that some inoperable cases may be made operable by adequate radiation. We personally know that some cases can be clinically arrested for five years or more by radiation alone. We believe that practically all cases can be very definitely palliated and the lives of many prolonged in comfort by such radiation.[†]

Can this be done by external high voltage roentgen radiation alone? We believe the answer is, yes in the majority of cases, provided the principles

[†] Treatment, without biopsy control, may lead to incorrect conclusions in a few individual cases, but in a large enough series of cases such error becomes clinically, though not scientifically, insignificant. Ewing says: "The majority of mammary carcinomata are rather easily recognizable by inspection and palpation, and microscopic examination, especially by frozen section, may usually be dispensed with or reserved for later study. A single, hard nodule in an otherwise unaltered breast is nearly always carcinoma."

TABLE 2.—*Length of Preoperative Roentgen Therapy Course and Interval Between Course and Operation.*

Author and Clinic	Duration of Course	Interval before Operation
Berven, Radiumhemmet..	7 days	21 days
Forsell, Sophiahemmet..	7 days	42 days
Wintz, Erlangen.....	7 days	7-14 days
Lynham, London.....	7 days	10-28 days
Levitt, Bart's Hospital....	14 days	42 days
Lee & Pack, Memorial.....	21 days	42 days

above outlined are adhered to. When we discuss and deprecate the poor results of radiation, we should ask ourselves, Are we not discussing the poor results of poor radiation? that is, incomplete radiation? When we discuss the end results of a certain operation or a certain operative technique we usually first ask "Who did the operation?" before we draw any conclusions. Similarly, before condemning radiation in a certain case as having been useless, we might ask who gave the radiation and how thoroughly?

When patients have extensive fixation of the primary tumor, or supraclavicular metastasis, or very extensive axillary metastasis, or distant involvement, we believe they are inoperable.

In general these cases are treated as follows:

1. *Primary Inoperable Cases, Without Distant Metastases.*—These patients are usually given one suberythema dose (600 r) to the entire involved hemithorax, anteriorly and posteriorly, at 70 or 80 centimeters T. S. D., using a 35 centimeter diameter skin area. This course is given in about one week; it is repeated in six weeks, again in six to eight weeks, and, in favorable cases, again in three months (a total of four courses in approximately seven months).

An alternative method might consist of giving four such doses (2,400 r) in four weeks at one period; the total dose would be 2,400 r anteriorly and 2,400 r posteriorly, but considering the large area treated and the proximity of the liver the patient's tolerance would be fully taxed.

2. *Primary Inoperable Case, With Distant Metastases.*—It is in patients with this type of lesion that the radiologist finds, paradoxically, some of his most gratifying results. To be called to see a woman with a pathological fracture of the hip, in crippling pain, and to be able to relieve her pain in a few days and to produce or aid early union of her fracture is surely a satisfactory type of medical care. To keep such a patient in normal health by occasional courses of radiation for a number of years is certainly worth while. Some of the most dramatic illustrations of the powers of the x-ray to arrest tumor growth and cause regeneration of bone are seen in patients hitherto given up as hopeless on account of crushed vertebrae or other skeletal metastases.

Our general plan is to treat the lesion causing the patient the greatest amount of disability or distress—frequently a spinal metastasis—and then attempt to palliate the primary lesion.

The involved area of bone, being usually deep seated, is treated at a long target skin distance, using a wide skin field. The patient is given 200 r daily, or every second day until 600 r (in air) has been given (front and back), with the factors previously mentioned.

Supportive plaster jackets, frames or splints have to be occasionally used during the stage of protraction repair.

The primary lesion, especially if distressing on account of odor or discharge, is treated at the same time, or shortly afterwards, by a technique similar

to that outlined under (1). We would like to make a special point of the fact that patients with even bulky fungating tumors frequently do better with radiation alone than when treated by mastectomy and then sent for radiation. We also would suggest that patients with clinically suspected, but not radiographically proven bone metastases should always be treated—since most of these patients, if not treated, eventually prove to have such, and valuable time may have been lost.

3. *Recurrent Inoperable Cases.*—These cases vary so much in type and in general resistance that it is impossible to suggest in this brief outline any comprehensive scheme of treatment. Small, definitely local recurrences may do well under the plan outlined under (1). Some cases are, of course, unresponsive, and may even need neurosurgical measures for relief of pain (for example, cases of brachial plexus involvement).

COMMENT

Such is a brief summary of our present practice in the roentgen treatment of mammary cancer. It embodies no novelties, and we can only furnish the much decried "clinical impression" for the faith is in us. Another ten years will very likely cause us to make outstanding changes in our methods, but at present, with the radiological facilities ordinarily available, we feel that as satisfactory results can be obtained by the technique above outlined as by other roentgen technique.*

What are the disadvantages of radiation? We have outlined above the answers to the disadvantages attributed to preoperative radiation. Does radiation in inoperable cases cause damage to the lungs? Our only answer to this is that we have not experienced it in our series. One case of suspected postroentgen fibrosis cleared up very considerably (spontaneously)—we suspect it may have really been a case of atelectasis from hilar gland pressure; this patient has not yet come to autopsy. Does radiation damage the skin? Yes, there is sometimes a late telangiectasis, partial atrophy or induration; two patients whose tumors were clinically "cured" for five years with roentgen treatment alone developed extensive telangiectases over the breast, etc. But they are clinically well, have no pain, have small fibrous masses in their breasts, and are more than content with their lot. No cases of "x-ray burns" (postroentgen ulceration) have been produced. Does radiation make some cases permanently anemic? No; we have seen no such cases.

CONCLUSIONS

Operable cases of cancer of the breast should, in our opinion, receive adequate preoperative roentgen radiation. Operable tumors in elderly

* Should the ovaries be radiated in cancer of the breast in women before the menopause? While certain investigations appear to point to the advisability of this procedure, we do not do so routinely. The average castration dose would be 500 r (air) to the pelvis, front and back, delivered in a few days. Should the pituitary gland be radiated in such patients? We do not believe that the clinical and experimental work published so far justifies the routine treatment of the pituitary as an aid to inhibition of tumor growth.

women may well be treated solely by radiation, but the advisability of relying on this treatment alone is still questionable. Judicious postoperative radiation seems advisable as a routine procedure.

Doubtfully operable cases should probably be given the benefit of the doubt, and be operated upon after a thorough preoperative course. Postoperative radiation is of unquestionable value in these cases, and should be given, we believe, routinely.

Inoperable cases should be handled by radiation alone, either by carefully planned external high voltage radiation, or by a combination of such radiation, with well filtered and carefully distributed interstitial radium radiation.

450 Sutter Street.

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DISCUSSION

LEO ELOESSER, M. D. (490 Post Street, San Francisco).—The thesis set forth by Doctors Rehfisch and Garland that roentgen treatment is of value in both operable and inoperable mammary cancer is so well established that it no longer needs discussion. Matters of detail, however, are still open to question; and as the authors avowedly record clinical impressions rather than statistical facts, perhaps I may be allowed to add my ideas to theirs. I am much indebted to them for their constant ready coöperation, for almost all of the mammary cancers that have come to me for treatment, both operable and inoperable, have had the benefit of their help. They have treated a number of patients with distant bony metastases, among them a woman who sustained a spontaneous fracture of a cancerous humerus; whose fracture healed as well as it would have in a normal bone, and who lived for some three years, attending to her daily affairs in comfort, until she died suddenly of a heart attack, which may have had no relation to her cancer. Of the value of x-ray for such patients there can be no doubt.

The question of what to do for patients who are to be operated upon is of greater interest. You will note I say "to be operated upon" and not "operable," for only time and the ultimate results can decide whether patients are really operable or not when they come to operation. The x-ray seems to have a definite effect in preventing both metastases and local recurrence. Local recurrence is less to be feared, for modern technique has reduced local recurrence greatly. Preoperative radiation, however, has given me such confidence that I think that very extensive removal of skin is no longer necessary. A three-limbed incision, radiating about the tumor as a center and excising a reasonable amount of skin, and as much as seemed suspicious of infiltration, has sufficed and made large defects to be covered with grafts unnecessary. Metastases to the axillary lymph nodes have also been greatly reduced, as well as recurrences of lymph nodules in cases in which cancerous axillary glands were removed at operation.

Patients with suspicious mammary growths, as well as those with definite cancers, have been sent for a series of preoperative radiation distributed over four or five days, as described by Doctors Rehfisch and Garland. During this period the patients were ambulatory; from one to five days after finishing the course, they were hospitalized and operated upon. The skin was incised with a knife, but after the skin was severed the rest of the operation was done with a Percy cautery, which seems safer and more effective than the radio knife. The results have been so astonishingly good that it would require much persuasion to make me deviate from this plan.

Early operation has seemed much preferable; one removes the great mass of cancer; the changes induced by the x-ray in the surrounding and distant tissues go on for several weeks after operation and tend, it seems, to render inactive the few remaining cancer cells which the tissues contain; the operation needs be less radical and less destructive. Fibrous shrinkage is not yet troublesome at operation, but goes on for several weeks afterward, so that one is still operating in soft tissues that may be easily and gently handled. It seems that, in theory at least, this plan is greatly to be preferred to one which delays operation until full fibrosis has become established, then reopens the indurated and scarry tissues which are still full of cancer, and closes them with no further help from the previously administered radiation, which in the three to six weeks of waiting for the delayed operation has spent its force.

I have done but one delayed operation on a breast cancer, and in that one I was so fearful of incising the scarry tissue that I had a course of x-ray repeated just before operation. Delayed operations done in the neck have been difficult: bleeding has been hard to control, the tissues difficult to handle, and recurrence has been prompt.

My knowledge of a combination of post- and preoperative radiation is meager. Preoperative treatment is the essential one. In cases in which mediastinal involvement seems likely, in young and plethoric women, postoperative treatment would seem indicated. However, whether pre- or postoperative, I fully agree with the authors that the dosage should not be so massive as to make the patient sick. If the women are badly nauseated, if they lose much weight and become anemic, they are likely to be more hurt than helped by the x-ray.

Patients with pleural effusions and patients with liver metastases have not been benefited by radiation. In others, radiation, as described above, has made of breast cancer a hopeful instead of a desperate disease.



ORVILLE N. MELAND, M. D. (1407 South Hope Street, Los Angeles).—This paper of Doctors Rehfisch and Garland is representative of the radiological viewpoint in the treatment of carcinoma of the breast. Therapeutic radiologists may differ in their technique and time spacing, but all are agreed that unless the patient is given irradiation in conjunction with her surgery, she is not receiving the benefit of all the approved weapons in stamping out the disease. Even surgeons who are not in favor of the use of preoperative treatment, or prophylactic postoperative treatment, agree as to the palliative benefits in local recurrences, and the painful metastatic lesions, as found in bone.

Every radiologist sees a number of patients with carcinoma of the breast who are in good condition, but have either an extensive local involvement or fixed involvement of the axillary nodes and, at times, supraclavicular involvement. These patients are plainly inoperable from the standpoint of complete eradication, for experience has shown that the disease may progress much more rapidly after incomplete removal than before. In patients falling into this group, we have been using interstitial radiation by means of platinum needles, the thickness of which is five-tenths millimeter. The amount of radium in each needle varies from one to two milligrams. The Keynes tech-

nique of insertion is used; namely, a complete barrage around the primary tumor, as well as needling in the axillary, supraclavicular, infraclavicular, and mediastinal fields. A little thought shows that in this method the effects of radiation are carried far beyond the field of the most radical breast surgery, as usually done. We have been doing this work over three years, and, although it is too early to say that it should be used in operable cases, it is a very superior method of treatment in the inoperable group. After the immediate radiation effects wear off, the breast slowly assumes a normal appearance and the nodes completely disappear. In some patients the primary tumor may shrink down to a small hard lump, composed of a mass of fibrous tissue in which remnants of carcinoma at times remain. This small tumor may then, if the patient demands, be removed by electrosurgery, with good palliative results.

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ALSON R. KILGORE, M. D. (490 Post Street, San Francisco).—That the treatment of carcinoma of the breast is a field of study to which the statistical method is inapplicable, is a statement which will be read with some surprise. Doctors Rehfish and Garland have stated quite properly that breast cancer in a pregnant woman under thirty, and in a woman over seventy, are two different diseases, and that even in women of comparable age, breast cancers present remarkable variations in pathologic structure and in clinical course. It is this very fact of extremely variable course which makes it unsafe to draw conclusions regarding efficiency of treatment from clinical impressions about one case or a few cases. If Doctors Rehfish and Garland intend to deprecate the cluttering of medical literature with statistical tables based upon series of twenty-five, fifty, or one hundred unclassified cases, I am in hearty agreement.

But four hundred cases of breast cancer is a substantial group, and conclusions from such a series should be significant, whether called "clinical impressions" or statistics.

With the conclusions that roentgen therapy offers relief and prolongation of life in inoperable cases, and especially preoperation therapy adds to the chances of successful surgical attack, no student of breast cancer will disagree. It is gratifying to see an intelligently planned, thorough technique adopted and adhered to.

Doctors Rehfish and Garland have pointed out one of the important questions still unanswered. Is efficiency of preoperation therapy dependent upon the time within which the treatment is given, or upon the interval between treatment and operation? Should operation be done immediately following radiation, after three to six weeks, or even after maximum regression of tumor mass has been obtained by repeated courses of treatment?

I do not see how these questions can be answered except by adequate "five-year cure" statistics, carefully controlled. From the number of cases required in each of various treatment method groups, it appears that we shall still wait a long time for our answers.

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DOCTOR GARLAND (Closing).—The problem of how long an interval to allow between the end of the preoperative course of roentgen therapy and the day of operation is, as Doctor Kilgore states, still a most unsettled one. The bulk of surgical and pathological experience would seem to indicate that with preoperative therapy, such as we have employed, marked fibrosis is not likely to develop so soon as four or six weeks after finishing the radiation. If it did, we would certainly hesitate to advise operation at that time.

We have seen marked fibrosis develop in a few cases, but each of these patients received three or four courses of roentgen therapy and the fibrosis did not develop for several months. As Doctor Eloesser indicates, his predilection for the short interval between the roentgen course and operation is based to some extent on the conditions found in one case, wherein

a long interval developed unintentionally. While the fibrosis in this case may have been entirely due to the radiation, it is not impossible that it was due partly to other factors as well (such as the type of tumor, and the presence of several preceding attacks of mastitis). Therefore, with all due respect to Doctor Eloesser's mature judgment, I personally feel that this experience would require confirmation by other similar cases before one could thereby support a contention that a delay of four weeks is dangerous.

In regard to Doctor Meland's work with radium needles, it requires a very large amount of radium in very special needles plus considerable experience in the insertion and distribution of those needles. Therefore, it is not yet a technique which can be used outside of a few fortunate and well-equipped centers. As previously noted, our aim in this paper was to present a technique which could be used in many parts of the country.

THE LURE OF MEDICAL HISTORY*

FIFTY YEARS OF PROGRESS IN THE PREVENTION OF DISEASE†

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II‡

QUARANTINE

QUARANTINE, derived from the Italian word "quaranta," meaning forty, is a term of the old sanitary system applicable today in administrative control of a number of diseases. The value of quarantine depends upon many factors, some of which were not taken into consideration or were quite misunderstood when it came first into use. Even today it is subjected to interpretations more or less conjectural; for instance, the two-week quarantine of contacts of cases of infantile paralysis. Quarantine regulations, fully enforced, generally mean loss of time to individuals, loss of commerce to nations, and a decided disturbance of the relations between doctor and patient, health officer and politician, health officer and some active religious cult. Originally, quarantine meant the detention of ships and men, had certain relations to the loading and unloading of cargoes; and later it was aggravated by introducing fumigation. Plague was thought to have been imported into London by bales of merchandise from Holland, which came previously from the Levant. The disease disappeared from London about 1703, perhaps helped by the great fire of 1666; but the disappearance was attributed to the quarantine regulations. The modern epidemiologist, however, while he recognizes that modification, gradation, and even cessation of many epidemic diseases may occur, knows that others

* A Twenty-five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellany Department of CALIFORNIA AND WESTERN MEDICINE, and its page number will be found on the front cover index.

† One of a series of public lectures by invited speakers, conducted by the Stanford University School of Medicine.

‡ From the Department of Public Health, San Francisco.

‡ This paper is appearing in serial form. For Part I, see November CALIFORNIA AND WESTERN MEDICINE, page 327.